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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/942,338	08/28/2001	John M. Caywood	CAY-006	8204

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EXAMINER	
WEISS, HOWARD	
ART UNIT	**PAPER NUMBER**
2814	

DATE MAILED: 04/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/942,338	CAYWOOD, JOHN M.	
	Examiner	Art Unit	
	Howard Weiss	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-93* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-93* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *09/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Attorney's Docket Number: CAY-006

Filing Date: 8/28/01

Continuing Data: This application is a CIP of 09/516,400 (03/01/2000 PAT 6,534,816)
which is a CIP of 09/275,168 (03/24/1999 ABN)
which is a CON of 09/275,168 (03/24/1999 ABN)
and is a CON of 09/731,942 (12/06/2000 PAT 6,479,863)
which is a CON of 09/522,252 (03/09/2000 PAT 6,384,451)

Claimed Foreign Priority Date: none

Applicant(s): Caywood

Examiner: Howard Weiss

Specification

1. The disclosure is objected to because of the following informalities:
   a. ---now U.S. Patent No. 6,534,816--- should be inserted after "2000" in Paragraph [001] Line 3;
   b. ---now U.S. Patent No. 6,479,863--- should be inserted after "2000" in Paragraph [001] Line 14;
   c. ---now U.S. Patent No. 6,384,451--- should be inserted after "09/522,252" in Paragraph [001] Line 16.

   Appropriate correction is required.

2. U.S. Patent Application Serial No. 09/552,252 is incorrectly referenced in Paragraph [001] Line 9. This application is not related to the instant application.

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

4. Claim 51 recites the limitation "said control gate" in Line 16. There is insufficient antecedent basis for these limitations in the claim.

5. Claim 52 recites the limitation "said control gate" in Line 16. There is insufficient antecedent basis for these limitations in the claim.

6. Claim 53 recites the limitation "said control gate" in Line 24. There is insufficient antecedent basis for these limitations in the claim.

7. Claim 54 recites the limitation "said control gate" in Line 26. There is insufficient antecedent basis for these limitations in the claim.

8. Claim 75 recites the limitation "said control gate" in Line 15. There is insufficient antecedent basis for these limitations in the claim.

9. Claim 76 recites the limitation "said control gate" in Line 15. There is insufficient antecedent basis for these limitations in the claim.

10. Claim 77 recites the limitation "said control gate" in Line 24. There is insufficient antecedent basis for these limitations in the claim.

11. Claim 78 recites the limitation "said control gate" in Line 24. There is insufficient antecedent basis for these limitations in the claim.

12. Claim 55 recites the limitations "said first portion and said second portion" in Lines 2 and 3. There is insufficient antecedent basis for these limitations in the claim.

13. Claim 56 recites the limitations "said first portion and said second portion" in Line 3. There is insufficient antecedent basis for these limitations in the claim.

14. Claim 57 recites the limitations "said first portion" and "said second portion" in Lines 1 and 2. There is insufficient antecedent basis for these limitations in the claim.

15. Claim 58 recites the limitations "said first portion and said second portion" in Lines 2 and 3. There is insufficient antecedent basis for these limitations in the claim.

16. Claim 59 recites the limitations "said first portion", "said second portion", "said first retention insulator" and "said second retention insulator." There is insufficient antecedent basis for these limitations in the claim.

17. Applicant is advised that should Claims 71, 73, 75 and 77 be found allowable, Claims 72, 74, 76 and 78, respectively, will be objected to under 37 CFR 1.75 as being substantial duplicates thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

18. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

19. Claims 79, 80, 82 to 84 and 86 to 93 are rejected under 35 U.S.C. 102(b) as being anticipated by Koyama (U.S. Patent No. 5,517,044).

Koyama shows all aspects of the instant invention (e.g. Figures 4) including:

- a plurality of nonvolatile memory elements **Q** arranged in rows and columns (Figure 6)
- a semiconductor body **1** of P-type conductivity
- first and second semiconductor regions **2a,b** of N-type conductivity with a channel **1a** between

- a polysilicon floating gate **4a** and a floating gate dielectric **3a**
- a retention dielectric **5a** of thickness between about 8 to 50 nm
- a grid electrode **6**
- a tunnel dielectric **3b** and a tunneling charge injector **10d**

In reference to the claim language referring to how the charge carriers are injected, intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. *In re Casey,152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963).*

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

21. Claims 1 to 78, 81 and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koyama and Tobin et al. (U.S. Patent No. 5,972,804).

Koyama shows most aspects of the instant invention (Paragraph 19) except for the grid insulator comprising SiO_xN_y with the oxide less than about 77% or graded, the band gap, bias and fermi level functional limitations and the thickness of the grid electrode. Tobin et al. teach (e.g. Figures 11 and 12) to make insulators comprising SiO_xN_y with the oxide less than about 77% or graded to reduce the amount of leakage current density (Column 14 Lines 47 to 49). It would have been obvious to a person of ordinary skill in the art at the time of invention to make insulators

comprising SiO_xN_y with the oxide less than about 77% or graded as taught by Tobin et al. in the device of Koyama to reduce the amount of leakage current density.

In reference to the claim language pertaining to the band gap, bias and fermi level functional limitations, the claiming of a new use, new function, or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best, 195 USPQ 430, 433 (CCPA 1977) and In re Swinehart, 439 F. 2d 210, 169 USPQ 226 (CCPA 1971)*; please see MPEP § 2112. Since Koyama and Tobin et al. show all the features of the claimed invention, the band gap, bias and fermi level functional limitations are an inherent property of Koyama and Tobin et al.'s invention.

Since the Applicant has not established the criticality of the thicknesses stated and since these thicknesses are in common use in similar devices in the art, it would have been obvious to one of ordinary skill in the art to use these values in the device of Koyama and Tobin et al. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).*

Double Patenting

22. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

23. Claims 1 to 93 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 to 65 of U.S. Patent No. 6,534,816. Although the conflicting claims are not identical, they are not patentably distinct from each other because each claim a nonvolatile memory with floating gate memory cells comprising source, drain and channel regions, grid and injector electrodes and oxygen-containing insulators. In reference to the claim language referring to how the charge carriers are injected, intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. *In re Casey,152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963).*

24. Claims 1 to 93 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 to 43 of U.S. Patent No. 6,479,863 in view of Tobin et al. U.S. Patent No. 6,479,863 claim most aspects of the instant invention including a nonvolatile memory with floating gate memory cells comprising source, drain and channel regions, grid and injector electrodes. U.S. Patent No. 6,479,863 does not claim the oxygen-containing material comprising SiO_xN_y with the oxide less than about 77% or graded. Tobin et al. teach (e.g. Figures 11 and 12) to make insulators comprising SiO_xN_y with the oxide less than about 77% or graded to reduce the amount of leakage current density (Column 14 Lines 47 to 49). It would have been obvious to a person of ordinary skill in the art at the time of invention to make insulators comprising SiO_xN_y with the oxide less than about 77% or graded as taught by Tobin et al. in the device of U.S. Patent No. 6,479,863 as claimed to reduce the amount of leakage current density.

In reference to the claim language referring to how the charge carriers are injected, intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. *In re Casey,152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963).*

In reference to the claim language pertaining to the band gap, bias and fermi level functional limitations, the claiming of a new use, new function, or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best, 195 USPQ 430, 433 (CCPA 1977) and In re Swinehart, 439 F. 2d 210, 169 USPQ 226 (CCPA 1971)*; please see MPEP § 2112. Since U.S. Patent No. 6,479,863 and Tobin et al. show all the features of the claimed invention, the band gap, bias and fermi level functional limitations are an inherent property of U.S. Patent No. 6,479,863 and Tobin et al.'s invention.

25. Claims 1 to 93 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 to 59 of U.S. Patent No. 6,384,451 in view of Tobin et al. U.S. Patent No. 6,384,451 claim most aspects of the instant invention including a nonvolatile memory with floating gate memory cells comprising source, drain and channel regions, grid and injector electrodes. U.S. Patent No. 6,384,451 does not claim the oxygen-containing material comprising SiO_xN_y with the oxide less than about 77% or graded. Tobin et al. teach (e.g. Figures 11 and 12) to make insulators comprising SiO_xN_y with the oxide less than about 77% or graded to reduce the amount of leakage current density (Column 14 Lines 47 to 49). It would have been obvious to a person of ordinary skill in the art at the time of invention to make insulators comprising SiO_xN_y with the oxide less than about 77% or graded as taught by Tobin et al. in the device of U.S. Patent No. 6,384,451 as claimed to reduce the amount of leakage current density.

In reference to the claim language referring to how the charge carriers are injected, intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. *In re Casey,152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963).*

In reference to the claim language pertaining to the band gap, bias and fermi level functional limitations, the claiming of a new use, new function, or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best, 195 USPQ 430, 433 (CCPA 1977) and In re Swinehart, 439 F. 2d 210, 169 USPQ 226 (CCPA 1971)*; please see MPEP § 2112. Since U.S. Patent No. 6,384,451 and Tobin et al. show all the features of the claimed invention, the band gap, bias and fermi level functional limitations are an inherent property of U.S. Patent No. 6,384,451 and Tobin et al.'s invention.

Conclusion

26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wang (U.S. Patent No. 6,580,642) teach the use f injector electrodes and Okada et al. (U.S. Patent No. 5,407,870) teach the use of SiO_xN_y.

27. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 872-9306**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the

hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via **Howard.Weiss@uspto.gov**.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group 2800 Receptionist at **(703) 308-0956**.

29. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 316, 321, 411	3/31/04
Other Documentation: PLUS Analysis Report	3/26/04
Electronic Database(s): EAST	3/31/04

HW/hw
1 April 2004

Howard Weiss
Patent Examiner
Art Unit 2814